

INTERNATIONAL CITY MANAGERS' ASSOCIATION
1313 EAST 60TH STREET - CHICAGO 37, ILLINOIS

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IMPROVING LOCAL TRAFFIC CONDITIONS

What is the best organization for street traffic control? How should cities plan and put into effect the measures for improving local traffic conditions?

American cities probably face no greater problem than the improvement of street traffic conditions. Traffic safety and the improvement of streets and highways have assumed the proportions of a national crusade. Everyone is interested in the traffic problem and everyone wants to do something about it. Only the larger cities, however, have the technical staff and funds available for improving urban traffic conditions.

This report is intended to provide guide lines for improving municipal traffic conditions in cities of less than 50,000 population. In the small city the automobile is more of a necessity than in a large city because of the absence of good public transportation. A higher proportion of the population owns automobiles in small cities than in large cities, and relatively more traffic is concentrated in the downtown section on the weekends, especially on Saturdays. Many smaller cities serve as retail shopping and trading centers for a large area which brings in a considerable number of cars from the surrounding countryside. Traffic is further complicated by state and national highways carrying high-speed inter-city traffic through the city.

In approaching the traffic problem the four major purposes of city streets should be kept in mind. These purposes are outlined here because understanding, based on factual data on the use of streets, must precede any steps to improve local traffic conditions. Discussion of street use of course brings in the question of street classification, without which it is impossible to develop a sound, economical program of physical and operational betterment.

The four types of service may be stated as follows: (1) Streets are used for through travel carrying high-speed traffic. (2) Streets are used to gain access to residential properties and to retail stores and other buildings. Serious congestion results on many of the "Main Streets" of America because of the conflict between through traffic on state and national highways and access traffic composed of motorists wishing to visit retail stores. (3) Streets are used for loading and unloading, including delivery of packages, unloading merchandise for retail stores, picking up shipments at factories and warehouses, and so on. (4) Streets are used for storage (parking) which probably causes more headaches for city officials than any other use of streets.

Organization for Traffic Planning and Control

Street traffic (planning, administration, control, construction, maintenance, and so on) probably is handled by more departments in the average city than any other municipal activity. For instance responsibility for traffic engineering is placed, in some cases, in the city engineer's office, in others in the department of public works or the street department, and sometimes in the police department.

The President's Highway Safety Conference recommends that in cities of less than 50,000 population an engineer, preferably the director of public works, the city engineer, or some member of his staff, perform the functions of traffic engineering. Many smaller cities place responsibility for traffic administration in a trained officer in the police department.

The important consideration is that primary responsibility be centered in one well-qualified employee, but that various phases of traffic work be done by the departments and agencies best suited for the work. Thus the city traffic engineer, whatever his title may be, will work with the planning agency in the development of new subdivisions and other phases of master street planning, with the street department on matters of street construction and maintenance, with the city engineer on design and location of streets, with the schools and other agencies on safety education, with the city department or private company providing public transportation, with the city attorney and the traffic courts on legal matters, and with the police department on traffic law enforcement and traffic supervision. These and other phases of traffic organization and management are discussed in some detail on pp. 122-136 of "Traffic Engineering Functions and Administration" (Public Administration Service, 1313 East 60 Street, Chicago 37. 1948. \$2.50).

Legal Basis for Traffic Control

It is essential to have an ordinance establishing authority and responsibility for street traffic control and to define in general terms the functions of traffic engineering. The best guide for city officials is the "Model Traffic Ordinance" which was first published in 1926 as a step toward uniform traffic laws and which has been brought up to date a number of times since then by the National Committee on Uniform Traffic Laws and Ordinances. The latest edition (1953) is available from the Government Printing Office, Washington 25, D. C., at 20 cents per copy, and covers organization, traffic enforcement, speed regulations, turning movements, public transportation, pedestrian rights and duties, bicycle regulations, automobile parking, traffic arrest procedures, and other phases of supervision and enforcement.

Traffic Planning and Studies

Street traffic always must be considered in relation to broader phases of community planning. It generally can be said that the official assigned the duties of traffic engineering is responsible for establishing the most effective use of the existing street system, while the planning agency proposes changes and improvements in the street system. The exact division of responsibility will vary from one city to another, but the important consideration is that these agencies work in close collaboration.

Community planning is a long-range program which affects and is effected by automobile traffic. One of the most important tools of planning is zoning, or the regulation of the use of private real estate. Good zoning, in turn, has an important bearing on street traffic and off-street parking. Zoning can be a real aid to the movement of traffic by compelling the provision of off-street parking and loading and unloading spaces, in new construction of different types, and by controlling land use and real property to aid automobile traffic. One of the most comprehensive treatments of this subject is "Zoning and Traffic" published in 1952 by the Eno Foundation for Highway Traffic Control, Saugatuck, Conn. The report is available to city officials on request.

The design and construction of well-planned residential subdivisions is another phase of community planning affecting automobile traffic. Subdivision regulations should provide minimum design standards for streets, intersections

and street lighting so that streets are well designed for automobile traffic and tied in with existing municipal street plans. Two good references on this subject are MIS Report No. 30, "Municipal Regulation of Land Subdivision", and "Building Traffic Safety into Residential Developments", published in 1949 by the National Committee for Traffic Safety, 425 North Michigan Avenue, Chicago 11, at \$1.

In addition to broad traffic and planning data the city needs specific information on traffic and parking conditions, at least at annual intervals. These data usually are compiled by the police department. Five major studies should be assembled and analyzed as a means of developing corrective steps and follow-up.

Accident Reports. A general accident analysis will bring out trends and show the places where additional enforcement or education is needed. An annual list of high-accident intersections, arranged according to number of accidents, should be compiled from accident reports as a basis for special study by collision diagrams. As a minimum, an accident spot map should be prepared to show the location of all accidents, and this map should be maintained continuously.

Collision Diagrams. Collision diagrams showing street location, weather conditions, time of day, and other factors should be made so that action can be taken whenever accident frequency increases in a particular location. Any street intersection with five or more collisions a year needs attention.

Parking. This is a periodic study of parking in the central business district, including a check of all on-street parking spaces and determination of the average time that these spaces are used on a typical business day.

Congestion. A congestion study is valuable to determine where, why and for how long automobiles are delayed on major streets. The study should show average traffic speed, the causes and amounts of traffic delay, locations where delays occur, and factors needing further study. Typical traffic delay causes turned up through such studies are poor signal timing, double parking, lack of pedestrian control, unrestricted left turns, and automobile parking maneuvers. Details of how to make such a study will be found in the "Manual of Traffic Engineering Studies" published in a new edition in October, 1953, by the Association of Casualty and Surety Companies, 60 John Street, New York City 38, at \$3.75.

Traffic Volume. This is a count of the volume of automobile, truck, and pedestrian traffic (per hour) using major streets. Such data reveal how traffic demand is changing by comparison with previous years' traffic volume levels. They also point up how close to saturation a business street is, saturation being the volume a traffic lane ordinarily can handle per hour under given conditions. An excessive count may show the need for prohibition of curb parking, the creation of one-way streets, or other measures. Volume counts also are useful for proper timing of traffic signals, for locating new traffic signals and stop signs, and for determining the intersections where turning movements should be prohibited or limited to certain hours of the day.

Traffic Control Methods

The various control measures discussed below require almost no financial outlay except for signs, pavement markings, and perhaps a few traffic signals; yet these measures can be highly effective in speeding up traffic flow and in relieving traffic congestion. Without minimizing the importance of good street planning, construction and maintenance, these control measures are the simplest and most hopeful steps any city can take towards relieving traffic congestion.

They are especially useful for cities under 50,000 population where little if any expensive redesigning and relocation of streets is feasible. The Annual Inventory of Traffic Safety Activities (described in the last section of this report) has shown that these are the methods most frequently used by cities in controlling traffic. None of these methods should be attempted, however, until a careful survey of all street traffic conditions has been made by competent personnel.

Through Streets. Stop regulations applied to all or most cross streets along a designated through street give some protection to traffic on the through street. Properly designated through streets will materially speed up the traffic and give more protection to side street traffic. Through streets generally should be limited to places where volume, speed, and continuity of traffic make the stop regulations more or less self-enforcing. They usually are not suitable for congested business districts.

Speed Control. Every city should thoroughly study the primary streets to determine speed limits in light of actual traffic conditions prevailing. Considerable traffic engineering research shows that urban street and rural highway speed limits should take into account the 85 percentile speed--that is, the speed at which or below which 85 per cent of the traffic moves--since this limit will be what the great majority of the drivers consider reasonable. If the speed limit is set too much below the 85 percentile speed, serious enforcement problems will be inevitable. In some cases, however, accident reports and collision diagrams may show that the posted speed limit, because of the accident hazard, must be set considerably lower than the 85 percentile speed.

Turning Regulations. Turning movements, both right and left turns, are an important cause of delay and traffic accidents at crowded intersections. A careful study of turning movements at heavy traffic intersections may show the need for elimination of left turns or for a special left turn signal on the traffic light. If pedestrian traffic is heavy on the cross street, right turns may also have to be prohibited. U turns are generally a poor practice anywhere in the business district or along any major street outside the business district.

One-Way Streets. Adoption of one-way streets has the advantage of reducing intersection conflicts, speeding up traffic, improving parking along the street and allowing a better system of traffic signal timing. Most traffic engineers are convinced that one-way regulation of traffic is an outstanding need in many cities. Considerable education and enforcement are needed, however, before motorists become thoroughly acquainted with the one-way system.

Parking and Loading. Undoubtedly the parking problem has received greater publicity than any other phase of urban traffic problems. It affects every kind of city and every kind of driver. It is the major cause of congestion in the central business district even in small communities. Almost every city has had to adopt some regulations to parcel out the limited curb space as fairly as possible. The "Model Traffic Ordinance" includes a number of provisions for controlling on-street parking, including prohibitions against parking at any time or against all-night parking, time limits on parking, parking meters, the control and limitation of angle parking in favor of parallel parking, and other types of restrictions and prohibitions.

An important part of the parking problem is the establishment and control of curb loading zones. Larger cities have been experimenting with limiting to early morning and late evening hours, the time during which deliveries and truck loadings can be made. There is quite naturally, strong opposition to this from business establishments and trucking companies, but the practice is more likely to spread than to decline as traffic congestion gets worse. The "Model Traffic Ordinance" has good provisions for the establishment of passenger and freight curb loading zones, including time limits during which any motor vehicle may use the zone.

There are many phases to curb parking control, including complete bans on parking, no parking during certain hours, time limit parking, parking meters, and loading zones. Improvement of parking conditions should include an inventory of on-street and off-street parking facilities and plans, where necessary, for municipal provision of off-street parking lots.

Information on parking lot design and garage operation is available in free publications from the Eno Foundation for Highway Traffic Control, Saugatuck, Conn. Methods of financing off-street parking facilities are fully described in "Parking--How It Is Financed," available from the National Retail Dry Goods Association, 100 West 31 Street, New York City, or from the Automotive Safety Foundation, 200 Ring Building, Washington 6, D. C., at 75 cents.

Traffic Signals. Traffic lights are one of the most important parts of traffic control, but they should be located at intersections only when traffic conditions justify it. Consideration must be given to traffic volume, right and left turn movements, pedestrian traffic, speed control, and reduction of accident hazards. Traffic lights properly installed and timed will provide for the orderly movement of traffic at busy intersections and help to reduce certain types of accidents.

Too many cities, however, have the attitude that traffic lights are a panacea for all intersection problems. Ample evidence shows this is not the case. Traffic lights tend to increase rear end collisions and may breed general contempt in the mind of the public for any kind of traffic control signal or sign. An analysis of several hundred traffic signal installations several years ago showed conclusively that unwisely installed and operated traffic control signals increased accidents in 30 to 35 per cent of the intersections and failed to improve accident conditions at an additional 10 to 15 per cent of the intersections. Carefully planned and properly operated, however, traffic lights remain one of the most effective methods of traffic control.

Standards of design and warrants for installation of traffic signals are fully described in the "Manual on Uniform Traffic Control Devices," available from the Government Printing Office, Washington 25, D. C., at 50 cents.

Traffic Routings. Different kinds of traffic routes can be selected, designated, and developed so as to encourage motor vehicles of different characteristics to use the streets best suited for their types of travel. Segregation of trucks and passenger cars is not always the answer. Instead, segregation should be made on the basis of the use of the streets. High speed traffic, for example, should be separated from low speed traffic. Through traffic and continuous movement of cars should be separated from vehicles making local stops and having non-continuous movement. City officials should work with state highway department engineers to develop by-pass routes.

Some cities have found it advisable to require heavy trucks and other large commercial vehicles to follow special routes and to stay off of certain streets and away from certain neighborhoods. Buffalo, N. Y., recently set up a system of truck routes based on a careful classification of all streets in the city. Trucks are banned from all parks and parkways and most of the residential streets in the city. The plan was preceded by three years of careful study during which the help of trucking companies was enlisted. Prior to the effective date of the plan in August, 1952, the trucking industry put the plan into effect itself and instructed drivers to adhere as much as possible to the designated truck route streets. The entire program is described in detail in the article, "The Buffalo Truck Route System," appearing in July, 1953, issue of Traffic Quarterly (Eno Foundation for Highway Traffic Control, Saugatuck, Conn.).

The standard reference work on these and other traffic engineering methods, techniques and procedures is the "Traffic Engineering Handbook," available from the Institute of Traffic Engineers, Strathcona Hall, New Haven 11, Conn., (second edition, 1950, \$6.).

Traffic Supervision

Traffic supervision involves at least three governmental agencies. The state driver-license department issues and in many states can revoke or suspend drivers licenses. Municipal traffic courts determine penalties for different types of offenses and levy fines or improvement on traffic violators. The municipal police department has the 24-hour-a-day job of traffic supervision, which includes traffic law enforcement, accident investigation, and traffic direction. The police department can provide valuable information for traffic engineering and education by maintaining accident records, making many types of accident studies, and making on-the-spot investigations of traffic accidents.

Traffic supervision by a municipal police department is a painstaking job involving careful planning and organization. The methods and techniques of police traffic supervision are described in detail in chapter 9 of the training manual, "Municipal Police Administration" (International City Managers' Association, 1313 East 60 Street, Chicago 37. 1950. \$7.50).

In small cities, many police departments in addition have had thrust upon them the traffic engineering work needed to reduce accidents and congestion. For those police departments a good reference is the book "Traffic Engineering and the Police" (revised edition, 1946) published by the Traffic Division of the International Association of Chiefs of Police, 1704 Judson Avenue, Evanston, Ill. at \$2.

Getting Public Acceptance

The organizations and individuals promoting traffic safety agree that education, public relations, and promotional efforts must be made to sell traffic safety.

The "Model Traffic Ordinance" suggests a traffic commission composed of city government officials to coordinate the work of the police department, public works department, traffic court, city planning commission, and other agencies. The need for such an organization is, however, seriously questioned in any size of city. A group of this kind was needed in the early days of traffic engineering to help support this newest of municipal functions, but today there is no more need for this type of coordinating agency in the traffic field than there is for a similar group dealing with welfare, water supply, or public health. Furthermore, the job of coordination is specifically the duty of the city manager or chief administrator.

There comments do not apply to a local safety council or citizens advisory group. Such a citizens organization is advisable in all cities to supplement the regular work of the city government in this field. A safety council operates to win support from the public for programs carried on by regular departments of the city government. The council can develop newspaper and radio publicity, organize school boy safety patrols, promote traffic safety contests among truck and bus operators, and serve as a community sounding board on all phases of traffic safety, education, and enforcement. The safety council should have broad representation from the police department, the traffic engineering or public works department, city planning commission, automobile clubs, and chamber of commerce, commercial fleet operators, and other groups with a direct interest in traffic safety.

The safety council will be more effective if it relies not only upon usual means of publicity but also on continuing efforts to stimulate city officials

into doing a better job in traffic safety. Regular municipal appropriations will do much to insure a permanent and worthwhile organization.

Membership in the National Safety Council is helpful to any city government agency or citizens organization interested in traffic safety. A traffic safety membership in the Council includes a number of publications, a monthly kit of promotional materials for safety programs called "Operation Safety," and the servicing of inquiries by mail on specific safety problems. Specific information on a traffic safety membership can be obtained from the National Safety Council, 425 North Michigan Avenue, Chicago 11, Ill.

Training for Traffic Employees

Among the best training being provided for traffic engineers is that at Yale and California Universities. The Bureau of Highway Traffic at Yale University provides professional graduate training and also participates in short courses in traffic engineering at selected universities throughout the country. The Institute of Transportation and Traffic Engineering at the University of California was established in 1947 for research and field activity on highway and airport problems, highway and airport planning and other phases of traffic and transportation. The Institute provides an advisory service to city officials in California.

In traffic law enforcement, the Traffic Institute of Northwestern University offers a broad training program. Training is conducted both at the Institute in Evanston, Ill., and in cooperation with major universities on a planned regional basis in other parts of the country. A nine month, academic year course for police traffic administrators is offered annually to give comprehensive training in traffic-police administration. The program also includes short courses of one to four weeks for police, driver-licensing personnel, laboratory technicians, traffic engineers, newspaper men, and records personnel. In cooperation with the Traffic Court Committee of the American Bar Association, the Institute conducts an intensive program of week-long conferences for judges and prosecutors who work in traffic courts. These conferences are conducted on a regional basis at law schools and universities throughout the country.

As part of its Summer Institute program in traffic training, the Traffic Institute presents a one-week seminar for practicing traffic engineers, with the purpose of presenting new and tried techniques and methods for dealing with city traffic problems. These seminars are conducted under the auspices of the midwest section of the Institute of Traffic Engineers.

Traffic Services for Cities. Several kinds of consulting services are available for city officials seeking help on local traffic problems. For example: The first and most obvious suggestion is the advice and aid on traffic problems which city officials can obtain from qualified engineers with the county and state highway departments.

Representatives of the Traffic Institute of Northwestern University, 1704 Judson Avenue, Evanston, Ill., will meet with city officials to discuss and evaluate traffic problems. Upon request recommendations will be made covering the requirements of the city for detailed study of traffic operations and installation of a sound, balanced program. As part of this service, the Traffic Institute collaborates with the Traffic Division of the International Association of Chiefs of Police, the Traffic Court Program of the American Bar Association, and the American Association of Motor Vehicle Administrators. Original discussion and evaluation are provided without cost. The study, preparation of a report, and installation

of recommendations are provided at actual cost, which is jointly agreed upon and embodied in a contract between the Institute and the city government. The major areas covered are police traffic operations, the courts, driver licensing, traffic laws, and traffic engineering.

Other cities may wish to use the extensive consulting services provided by a number of firms and individuals in the field of traffic planning and engineering. The Institute of Traffic Engineers, Strathcona Hall, New Haven 11, Conn., the professional organization of traffic engineers, will furnish a list of available consultants upon request. Cities should consider jointly hiring traffic consultants to review periodically the traffic conditions in each city. Suggestions for this approach are contained in the article, "Traffic Engineering Problems in Cities under 50,000 Population", appearing in the October, 1953, issue of Traffic Quarterly (Eno Foundation for Highway Traffic Control, Saugatuck, Conn.).

The Annual Inventory of Traffic Safety Activities is one of the most important services of the National Safety Council (425 North Michigan Avenue, Chicago 11) that is available to city governments. The Inventory employs detailed questionnaires filled out annually by participating cities. They cover nine major topics; death and injury record, traffic ordinances, accident facts, traffic engineering, traffic law enforcement, traffic courts, school traffic safety education, public information, and safety organization. Almost 800 cities over 10,000 population in the United States participated in the annual inventory covering the calendar year 1952.

Any city over 10,000 population in the United States is eligible to participate in the Inventory without cost. A city official can ask for an analysis of the inventory forms, and the National Safety Council staff will review the forms and prepare a report with conclusions, and recommendations for improvement in various phases of traffic control and safety, tailored to the needs of the individual city.

The Accident Prevention Department of the Association of Casualty and Surety Companies (60 John Street, New York City 38) pioneered in promoting safe driver education for high school students. The staff is available for working with colleges and universities in conducting teacher preparation courses in safe automobile driving. The Accident Prevention Department has published a number of reports on traffic safety. One of the most useful for city officials is "How to Attack the Traffic Accident Problem in Your Community" which stresses the "how" of traffic accident prevention. It is available without charge to city officials.

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